

## ***Interactive comment on “Effect of ocean acidification on the structure and fatty acid composition of a natural plankton community in the Baltic Sea” by J. R Bermúdez et al.***

### **Anonymous Referee #2**

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The manuscript “Effect of ocean acidification on the structure and fatty acid composition of a natural plankton community in the Baltic Sea” by Bermúdez et al. is a well-written and interesting study on a topic of general interest. The aim of the study was to analyze the effect of increasing CO<sub>2</sub> concentrations and ocean acidification on a coastal plankton community of the eastern Baltic Sea. The authors hypothesize that coastal/brackish environments have a high tolerance to increased CO<sub>2</sub> concentrations, since they face naturally fluctuations in CO<sub>2</sub> and pH in coastal systems. The results support this hypothesis, since there was no significant difference in community composition, Seston and Copepod FA concentration between treatments with different CO<sub>2</sub> concentrations. FA composition changed over time in all CO<sub>2</sub> treatments, which was

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explained by a change in community composition due to nutrient limitation.

Thus, the authors confirmed results found in the western Baltic Sea by Thomsen et al. (2010), Nielsen et al. (2010) and Rossoll et al. (2013), who also could not find any effect of elevated CO<sub>2</sub> concentrations on mussels and plankton communities. The introduction clearly explains the purpose of the study and presents it in a suitable context. Methods used in this study are appropriate and the results and figures well presented. The discussion addresses research questions posed in the introduction and interprets the results in light of previous knowledge. I think it would be very informative to include pH values of the different CO<sub>2</sub> treatments in the analysis, since pH is the actual factor that might affect marine organisms.

Otherwise, I have only few suggestions for improvement:

I. 50: “has increased the atmospheric concentration”

I. 122: Was pH measured in the CO<sub>2</sub> treatments?

I. 143: “algal fatty acid”: better “seston fatty acid” as seawater samples include zooplankton. Were copepods removed before filtering seawater for seston fatty acid analysis?

I. 168: Is there information on individual fatty acids? Not all PUFAs are essential food for copepods.

I. 208/209: “decrease in dinophyta (...) (Fig. 2c)”: Fig. 2c shows an increase in dinophyta? I guess the decrease from phase 1 (Fig. 2c) to phase 2 (Fig. 2d) is meant here?

I. 275: “have been identified as rich in PUFA”

I. 242: “MUFA and SFA increased in both species (Fig. S3)”: Fig. S3 shows a decrease in MUFA and an increase in SFA in both copepod species.

I. 282: “Triacylglycerols tend to be rich”

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I. 288: “consequences for the cell physiology”

I. 317: “daily basis during their vertical migration”

Figure 2a/b: legend for symbols is missing. However, I think here they are unnecessary since  $f\text{CO}_2$  is on the x-axis.

Figure 3a: same as Fig. 2a/b (and Fig. 5a/b). Why are  $f\text{CO}_2$  values different in each figure?

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